I CLAIM:

1. A method for removing scratches from a planar panel of a translucent or transparent material, comprising the step of controllably heating at least a local region of a top surface of the panel so as to melt a relatively thin surface layer of the material in the at least local region, wherein the melted material re-flows and smooths at least a local region of the top surface of the panel.

2. The method of claim 1, wherein said step of controllably heating is performed with a substantially linear heat source.

3. The method of claim 2, wherein said substantially linear heat source produces a relatively thin, substantially linear flame and the step of controllably heating includes progressively applying the relatively thin substantially linear flame across a band of the top surface of the panel, wherein the band has a width which is about equal to the length of the flame.

4. The method of claim 2, wherein the step of controllably heating includes moving the substantially linear heat source at a substantially uniform rate along a linear path of movement that is not parallel to the length of said heat source.

5. The method of claim 4, wherein the axis of movement is substantially perpendicular to the length of the heat source.

6. The method of claim 2, wherein said substantially linear heat source comprises a burner nozzle for generating a slot of burning fuel about 1 to about 10 mm in width.

7. The method of claim 2, wherein said substantially linear heat source comprises a burner nozzle for generating a slot of burning premixed fuel mixture about 1 to about 10 mm in width and wherein the premixed fuel mixture comprises a fuel and oxygen.

8. The method of claim 2, wherein said substantially linear heat source comprises a diffusion torch in the form of a multiplicity of tubes each having a first end, the first ends of the multiplicity of tubes being arranged in a linear array, and wherein alternating ones of the multiplicity of tubes respectively deliver oxygen and fuel to the first ends thereof.

9. The method of claim 2, wherein said substantially linear heat source comprises a diffusion torch having a channel having a multiplicity of orifices, wherein the channel delivers oxygen and fuel to the multiplicity of orifices thereof.

10. The method of claim 2, wherein the step of controllably heating includes controlling the temperature of the heat source.

11. The method of claim 7, wherein both the planar panel and the slot of burning premixed fuel mixture are substantially vertically oriented, and the step of controllably heating comprises:

a) moving the burner nozzle over the top surface of planar panel at a substantially uniform velocity along a path of movement substantially perpendicular to the length of the slot;

b) controlling the distance between the burner nozzle and the top surface of the planar panel;

c) selecting the fuel used in the premixed fuel mixture;

d) controlling the fuel to oxygen mixing ratio;

e) controlling the flow rate of the fuel; and

f) controlling the tilt, if any, of the planar panel away from an upper end of the slot of the burning fuel mixture.

12. The method of claim 11, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:3.4; the distance between the burner nozzle and the top surface of the planar panel is approximately 1.3 cm; the fuel flow rate is in the range of 3.6 to 6.8 liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the planar panel is in the range of 0.34 to 0.86 mm/sec.

13. The method of claim 11, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:2.4; the distance between the burner nozzle and the top surface of the planar panel is approximately 1.1cm; the fuel flow rate is in the range of 4 to 6.8 liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 0.48 to 0.85 mm/sec.

14. The method of claim 11, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:3.9; the distance between the burner nozzle and the top surface of the planar panel is approximately 1.0 cm; the fuel flow rate is in the range of 4.8 to 7.9 liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the top surface of planar panel is in the range of 0.94 to 1.05 mm/sec.

15. The method of claim 11, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:3.3; the distance between the burner nozzle and the top surface of the planar panel is approximately 0.9 cm; the flow rate of the fuel is in the range of 4.0 to 6.2

liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 0.68 to 1.03 mm/sec.

16. The method of claim 11, wherein the fuel comprises acetylene; the fuel to oxygen mixing ratio is approximately 1:1.2; the distance between the burner nozzle and the top surface of the planar panel is approximately 5.8 cm; the flow rate of the fuel is in the range of 1.1 to 1.5 liters/minute/5cm of burner nozzle length; the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 5.0 to 6.9 mm/sec; and the tilt of the planar panel away from the upper end of the burner nozzle is approximately 2°.

17. The method of claim 11, the fuel comprises acetylene; the fuel to oxygen mixing ratio is approximately 1:1.2; the distance between the burner nozzle and the top surface of the planar panel is approximately 3.5 cm; the flow rate of the fuel is in the range of 1.1 to 1.6 liters/minute/5 cm of burner nozzle length; the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 5.0 to 6.9 mm/sec; and the title of the planar panel away from the upper end of the burner nozzle is approximately 2°.

18. An apparatus for removing scratches from a surface of a planar panel of translucent or transparent material comprising:

a) a heat source capable of providing sufficient heat to melt the material of the planar panel and being adjustably positioned in proximity to the surface of the planar panel;

b) a carriage assembly on which the heat source is adjustably mounted so that the distance between the heat source and the surface of the planar panel may be varied;

c) a linear rail assembly to which the carriage assembly is mounted for movement of the carriage along the rail assembly;

d) a motor drive assembly for moving the carriage assembly along the rail assembly; and

e) reference brackets slidably attached to the rail assembly for positioning the rail assembly with respect to the surface of the planar panel, wherein the temperature of the heat source and the distance of the heat source from the surface of the planar panel are adjusted such that when the motor drive assembly moves the carriage assembly along the rail assembly at a predetermined moving velocity, heat from the heat source is progressively applied across the surface of the planar panel at the moving velocity so as to melt a surface layer of the material of the planar panel in a band across the surface and cause the melted material to re-flow and smooth the surface of the band.

19. The method of claim 18, wherein the heat source is a substantially linear heat source.

20. The apparatus of claim 19, wherein the substantially linear heat source is a torch producing a relatively thin, substantially linear flame, and the band has a width approximately equal to the length of the flame.

21. The method of claim 19, wherein said substantially linear heat source is positioned such that movement of the carriage assembly along this linear rail assembly at a substantially constant speed causes the substantially linear heat source to move across the surface of the planar panel at the substantially constant speed in a direction of movement that is not parallel to the length of the heat source.

22. The apparatus of claim 21, wherein the heat source is positioned such that the direction of movement is substantially parallel to the length of the substantially linear heat source.

23. The apparatus of claim 21, wherein the direction of movement of the heat source is substantially parallel to the linear rail assembly.

24. The apparatus of claim 19, wherein the substantially linear heat source comprises a burner nozzle for generating a slot of burning fuel about 1 mm to about 10 mm in width.

25. The apparatus of claim 19, wherein the substantially linear heat source comprises a burner nozzle for generating a slot of burning premixed fuel mixture about 1 mm to 10 mm in width, and wherein the premixed fuel mixture comprises fuel and oxygen.

26. The apparatus of claim 19, wherein the substantially linear heat source comprises a diffusion torch comprising a multiplicity of tubes each having a first end, the first ends of the multiplicity of tubes being arranged in a linear array, and wherein alternating ones of the multiplicity of tubes respectively deliver oxygen and fuel to the first ends thereof.

27. The apparatus of claim 26, wherein the first ends of the multiplicity of tubes each has a tip made of a ceramic material.

28. The apparatus of claim 19, wherein the substantially linear heat source comprises a diffusion torch having a channel with a linear nozzle at one end thereof, the channel being adapted to deliver oxygen and fuel to the linear nozzle

29. The apparatus of claim 18, wherein the heat source is a torch for burning a mixture of fuel and oxygen, and wherein the temperature of the torch is controlled by controlling the flow rate and the mixing ratio of fuel and oxygen supplied thereto.

30. The apparatus of claim 29, wherein the flow ratio and the mixing ratio fuel and oxygen supplied to the torch are controlled by a computer.

31. The apparatus of claim 18, wherein the motor drive assembly is controlled by a computer for controlling the moving velocity of the heat source across the surface of the planar panel.

32. The apparatus of claim 25, wherein the heating of the surface of the planar panel is controlled by the type of fuel, the fuel to oxygen mixing ratio, the distance of the burner nozzle from the surface of the planar panel, the flow rate of the fuel; and the moving velocity of burner nozzle with respect to the surface of the planar panel.

33. The apparatus of claim 32, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:3.4; the distance between the burner nozzle and the top surface of the planar panel is approximately 1.3 cm; the fuel flow rate is in the range of 3.6 to 6.8 liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the planar panel is in the range of 0.34 to 0.86 mm/sec.

34. The apparatus of claim 32, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:2.4; the distance between the burner nozzle and the top surface of the planar panel is approximately 1.1cm; the fuel flow rate is in the range of 4 to 6.8 liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 0.48 to 0.85 mm/sec.

35. The apparatus of claim 32, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:3.9; the distance between the burner nozzle and the top surface of the planar panel is approximately 1.0 cm; the fuel flow rate is in the range of 4.8 to 7.9 liters/minute/5cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the top surface of planar panel is in the range of 0.94 to 1.05 mm/sec.

36. The apparatus of claim 32, wherein the fuel comprises propane; the fuel to oxygen mixing ratio is approximately 1:3.3; the distance between the burner nozzle and the top surface of the planar panel is approximately 0.9 cm; the flow rate of the fuel is in the range of 4.0 to 6.2 liters/minute/5 cm of burner nozzle length; and the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 0.68 to 1.03 mm/sec.

37. The method of claim 32, wherein the fuel comprises acetylene; the fuel to oxygen mixing ratio is approximately 1:1.2; the distance between the burner nozzle and the top surface of the planar panel is approximately 5.8 cm; the flow rate of the fuel is in the range of 1.1 to 1.5 liters/minute/5 cm of burner nozzle length; the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 5.0 to 6.9 mm/sec; and the tilt of the planar panel away from the upper end of the burner nozzle is approximately 2°.

38. The apparatus of claim 32, wherein the fuel comprises acetylene; the fuel to oxygen mixing ratio is approximately 1:1.2; the distance between the burner nozzle and the top surface of the planar panel is approximately 3.5 cm; the flow rate of the fuel is in the range of 1.1 to 1.6 liters/minute/5 cm of burner nozzle length; the moving velocity of the burner nozzle with respect to the top surface of the planar panel is in the range of 5.0 to 6.9 mm/sec; and the title of the planar panel away from the upper end of the burner nozzle is approximately 2°.